

RECEIVED
CENTRAL FAX CENTERIn the Claims:

SEP 24 2007

Claim 1 (previously presented) An electrocatalyst for oxygen reduction comprising a cobalt and ruthenium sulfide supported on a conductive carbon black.

Claim 2 (cancelled).

Claim 3 (previously presented) The electrocatalyst of claim 1 wherein said conductive carbon black is a carbon black having a surface area exceeding 120 g/m².

Claim 4 (cancelled).

Claim 5 (previously presented) The electrocatalyst of claim 1 obtained by incipient wetness impregnation of said carbon black support with an aqueous solution of precursor salts of cobalt and ruthenium, optionally comprising ruthenium chloride, drying the impregnated carbon black support and treating the resulting product under an atmosphere of hydrogen sulfide optionally diluted with an inert carrier gas.

Claim 6 (previously presented) The electrocatalyst of claim 3 obtained by aqueous precipitation of a cobalt and ruthenium oxide on said carbon black, drying and treating the resulting product under an atmosphere of hydrogen sulfide optionally diluted with an inert carrier gas.

Claim 7 (previously presented) The electrocatalyst of claim 1 wherein said sulfide is a ternary sulfide of ruthenium and cobalt.

Claims 8 and 9 (cancelled).

Claim 10 (previously presented) The electrocatalyst of claim 1 wherein the atomic ratio Ru:Co is comprised between 0.2 and 5.

Claim 11 (cancelled).

Claim 12 (previously presented) The electrocatalyst of claim 1 obtained by incipient wetness impregnation of carbon black support with an aqueous solution of precursor salts of ruthenium and of cobalt, drying said impregnated carbon black support and treating the resulting product under an atmosphere of hydrogen sulfide optionally diluted with an inert carrier gas.

Claim 13 (previously presented) The electrocatalyst of claim 12 wherein said precursor salts comprise at least one of RuCl₃ and Co(NO₃)₂.

Claim 14 (previously presented) The electrocatalyst of claim 12 wherein said aqueous solution of precursor salts comprises 2-propanol.

Claim 15 (previously presented) The electrocatalyst of claim 12 wherein said drying step is carried out under vacuum at a temperature above 90°C.

Claim 16 (previously presented) The electrocatalyst of claim 12 wherein said treatment under an atmosphere of hydrogen sulfide is carried out in a flow reactor.

Claim 17 (previously presented) The electrocatalyst of claim 12 wherein said treatment under an atmosphere of hydrogen sulfide is carried out at a temperature exceeding 100°C.

Claim 18 (previously presented) The electrocatalyst of claim 12 wherein said treatment under an atmosphere of hydrogen sulfide is protracted for a time exceeding thirty minutes.

Claim 19 (previously presented) The electrocatalyst of claim 12 wherein said inert carrier gas is nitrogen and the molar ratio of said hydrogen sulfide is comprised between 0.5 and 4.

Claim 20 (previously presented) A gas diffusion electrode comprising a conductive web wherein the catalyst of claim 1 is applied on at least one face of said conductive web.

Claim 21 (previously presented) The gas diffusion electrode of claim 20
wherein said conductive web is a carbon cloth.

Claim 22 (previously presented) The gas diffusion electrode of claim 20
wherein said catalyst is mixed with an optionally perfluorinated hydrophobic binder.

Claims 23 to 35 (cancelled).

Claim 36 (previously presented) A method for producing a gas diffusion
electrode of claim 20 comprising coating said conductive web on at least one side thereof
with said catalyst optionally mixed with a first hydrophobic binder.

Claim 37 (previously presented) The method of claim 36 wherein said
conductive web is a carbon cloth.

Claim 38 (previously presented) The method of claim 36 wherein said first
hydrophobic binder is perfluorinated.

Claim 39 (previously presented) The method of claim 36 wherein said
conductive web is coated with a mixture of carbon powder and a second optionally
perfluorinated hydrophobic binder on at least one side thereof, prior to said coating with
said catalyst.

Claim 40 (previously presented) The method of claim 36 further comprising a final sintering step.

Claim 41 (previously presented) A method for producing a gas diffusion electrode comprising a conductive carbon black web wherein an electrocatalyst for oxygen reduction comprises a cobalt and ruthenium sulfide supported on carbon comprising coating a conductive web on at least one side thereof with the electrocatalyst optionally mixed with a first hydrophobic binder, subjecting the web to a sintering step by heating under a hydrogen atmosphere from room temperature up to an intermediate temperature, and subsequently heating under an inert atmosphere from said intermediate temperature up to a final temperature.

Claim 42 (previously presented) The method of claim 41 wherein said intermediate temperature is between 100 and 120°C.

Claim 43 (previously presented) The method of claim 41 wherein said final temperature is between 300 and 350°C.

Claim 44 (previously presented) The method of claim 41 wherein said inert atmosphere is an argon atmosphere.

Claim 45 (currently amended) A process of hydrochloric acid depolarized electrolysis comprising assembling the gas diffusion electrode of claim 20 comprising a conductive web having an electrocatalyst comprising a cobalt and ruthenium sulfide

supported on a conductive carbon black as the cathode of an electrolysis cell fed with a hydrochloric acid aqueous solution and supplying oxygen thereto while applying electrical current.

Claim 46 (previously presented) The electrocatalyst of claim 10 wherein the atomic ratio is 2.8 to 3.2.

Claim 47 (previously presented) The electrocatalyst of claim 17 wherein the temperature is between 300 and 500°C.

Claim 48 (previously presented) The electrocatalyst of claim 18 wherein the time is 1 to 4 hours.